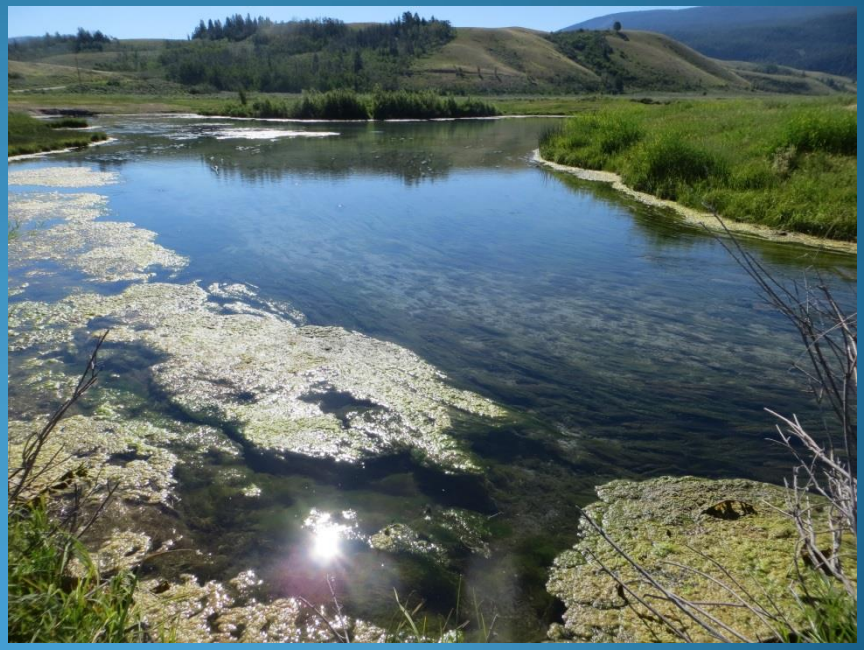
Non-Native Exotic Fish in Grand Tetons National Park

Park Mission:

The National Park Service preserves unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations.



Anton M. Yelk

Formation of Kelly Warm Springs

- 1925 – Gros Ventre Slide occurs, creating a large earthen dam
- 1927 – The dam fails, the resulting flood destroying the local town of Kelly WY
- 1927 – A local thermal mud spring begins discharging large amounts of water
  - Referred to as the “Miracle Springs” by Mormon Row Ranchers
  - Ranchers excavate an irrigation ditch to their fields connecting through Ditch Creek to the Snake River
- 1945-46 – Spring pools bulldozed together to allow greater discharge
- 1946 – Area becomes part of Grand Tetons National Park

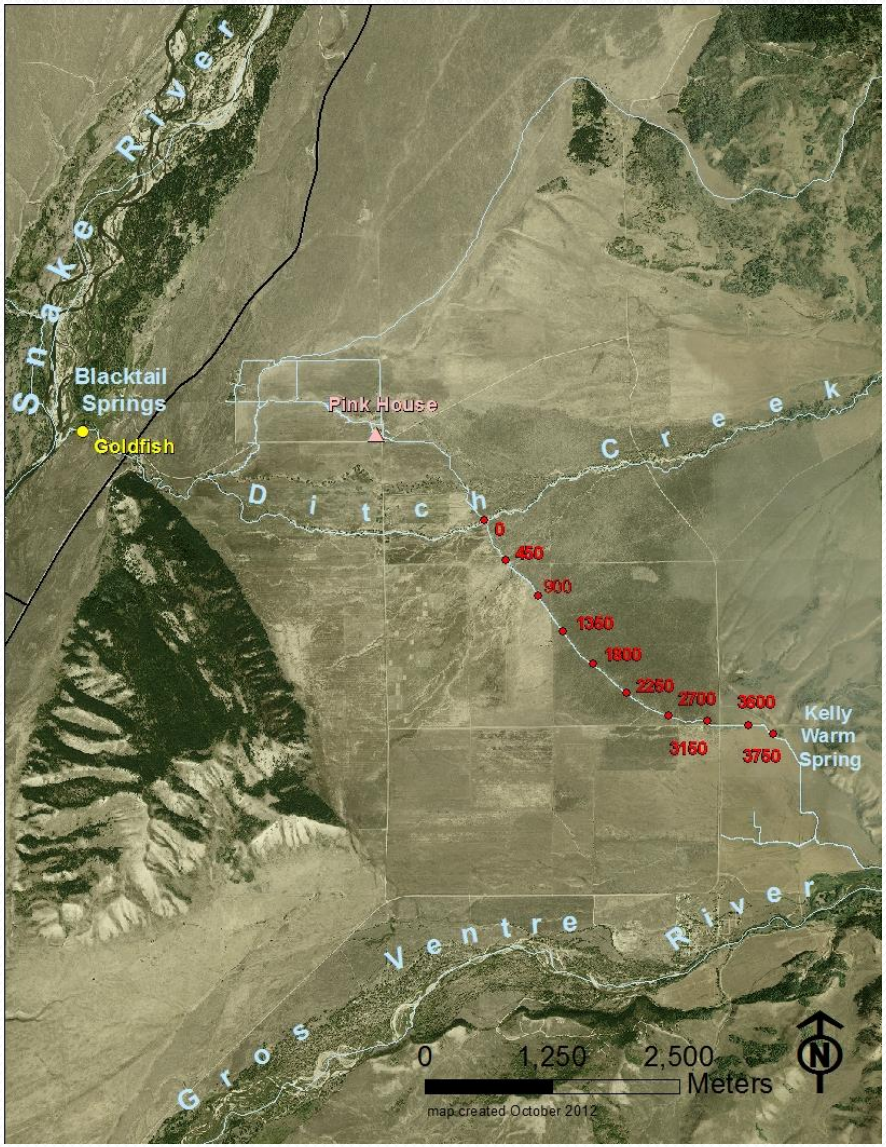
- Known home to a large population of aquarium and other non-native fish
  - Out competing of Native fish populations documented
- The Non-native aquarium fish are assumed by many to be thermally bounded to the Spring ‘s main pool

Green Swordtail

Convict/Zebra Cichlid

Not So!

- 2009 – Grand Teton Fisheries personnel found a goldfish and multiple other exotic non-natives in Ditch Creek <1/4 mile from the Snake River.
- Pose a direct threat to the health of the Snake River



- Proposed four year project
  - monitor and inventory the Kelly Warm Springs and water ways
  - expand public knowledge
- Joint project
  - National Park Service
  - United States Geological Survey
  - the Wyoming Fish and Game.

Objectives

- prepare the project for the next four years of interpreter and inventory work.
- materials to be produced
  - Development of volunteer data collection programs for multiple grade groups
    - 6-8th
    - 9-10th
    - 11-12th
  - Preform programs for test school groups of each grade level

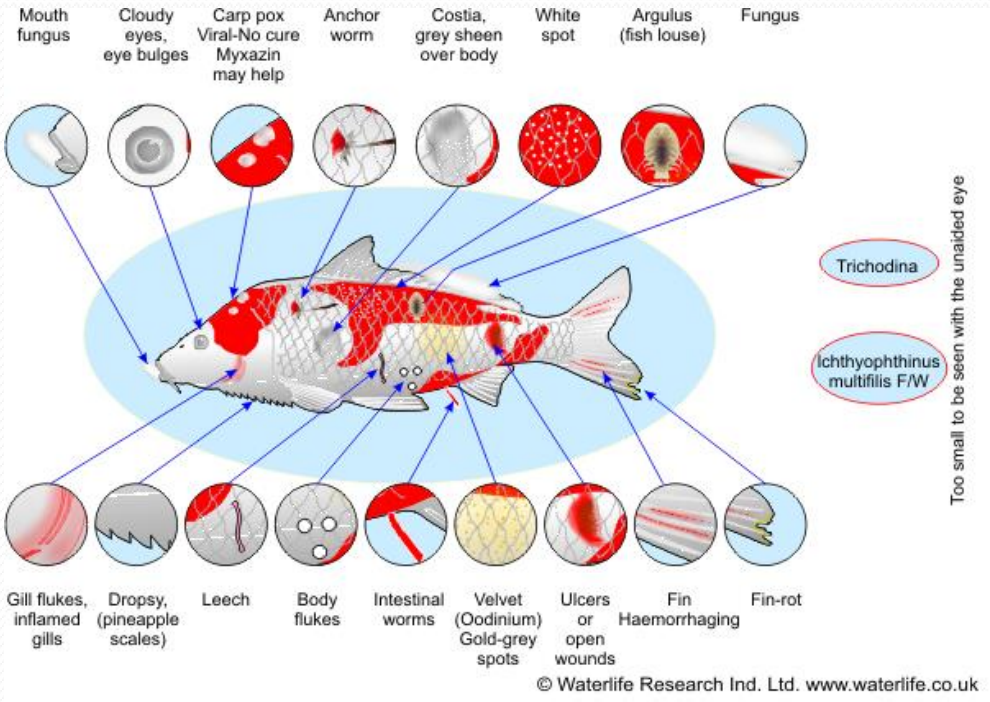
Objective Cont'd

- Develop databases and data collection methods to store data
- Develop visual signs to be placed at springs
- Create long term monitoring sites
- Draft Monitoring Protocol

Objective Cont'd

- Record thermal gradient of Springs and water ways

- Send fish to lab to test for potential pathogens

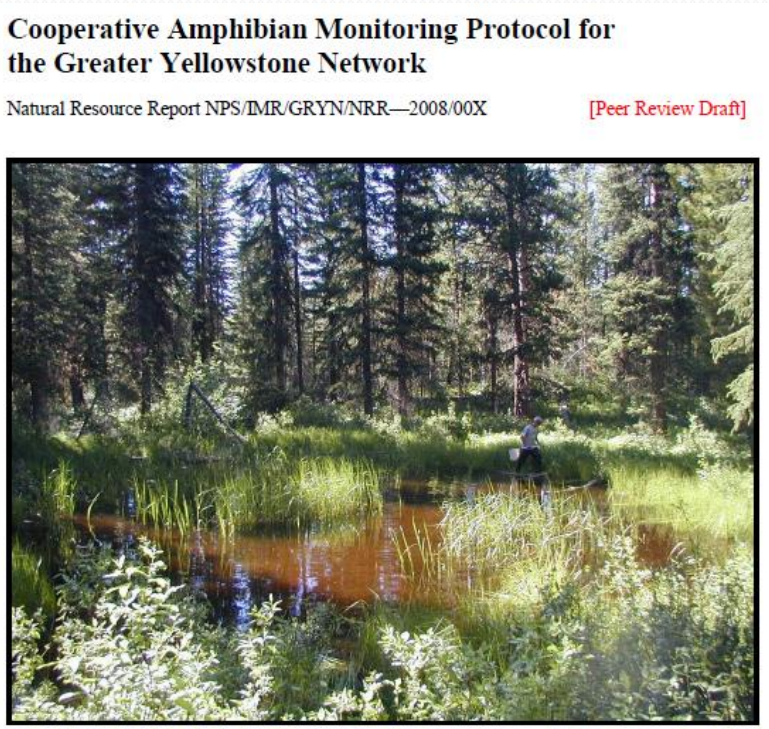


Methods

- Multiple sampling methods were considered and tested, to be used for the data collection programs
  - Minnow Trap sampling chosen due to ease
  - Electro Shocking sampling chosen to locate any fish which may look to be infected

Methods cont'd

- Research on ways to convey science to the public through Interpretation programs was research as well as recent "Citizen Science" programs produced by Yellowstone National Park



Results

- Data Collection Programs were created and implanted with overall success
- Databases and Data collection methods were implemented and completed.

Location: _____ **Site#:** _____

Date: _____ **Time:** _____

Water Temp Celsius: _____ **AirTemp Celsius :** _____

pH: _____ **Hardness ppm:** _____

Total Alkalinity ppm: _____

Total Chlorine ppm: _____ **Free Chlorine ppm:** _____

Nitrate ppm: _____ **Nitrite ppm:** _____

Water Depth (approx.): _____

Aquatic Vegetation Coverage (low-high): _____

1) Aquatic Species viewed (in environment) check all that apply And Approximate count: Tally

o Convict/Zebra Cichlid	o Redside Shiner
o Male Swordtail	o Guppies
o Female Swordtail	o Speckled Dace
o Madtom :	o Utah Chub
o Tadpoles Stage 1	o Tadpoles Stage 2

o Other:	

Picture Files (file names) just in order pictures were taken

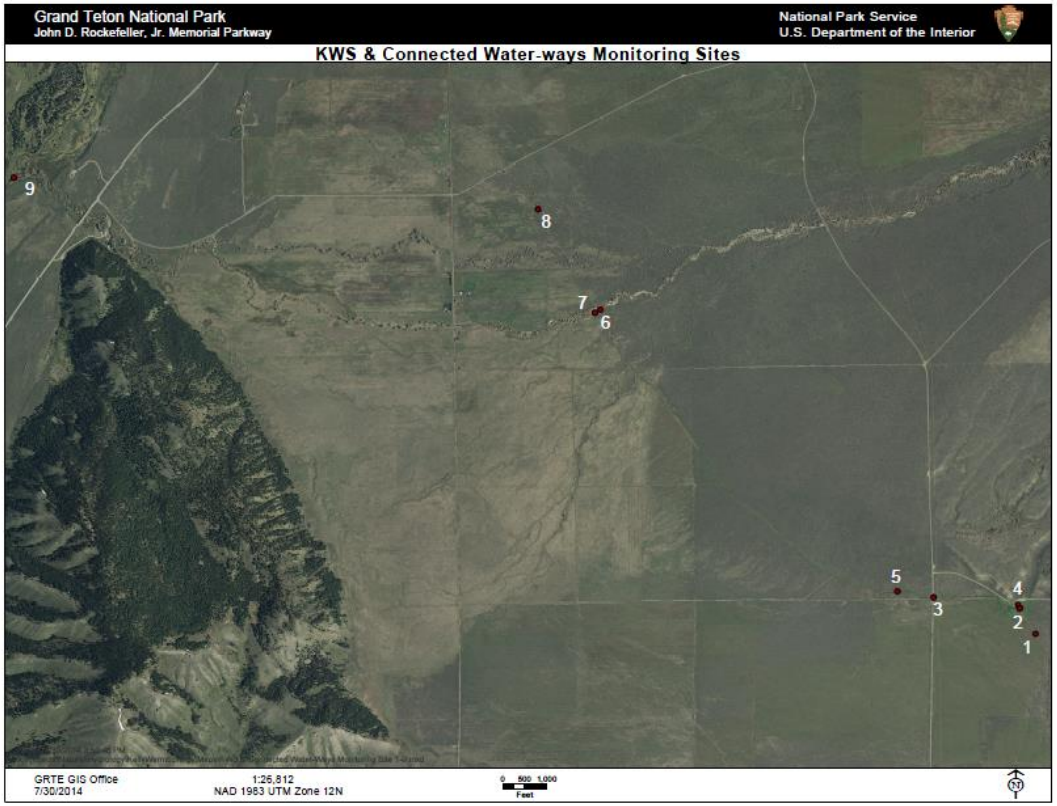
1) Picture File Name: _____

2) Aquatic Species Captured (minnow seal and Count (check all that apply and tally number)

o Convict/Zebra Cichlid (CZC)	o Redside Shiner (RS)
o Male Swordtail (MS)	o Guppies (GP)
o Female Swordtail (FS)	o Speckled Dace (SD)
o Madtom (MT)	o Utah Chub (UC)
o Tadpole Stage 1 (TS1)	o Tadpole Stage 2 (TS2)
o Other:	

Results cont'd

- Signs posted and Wayside awaiting edits
- Draft Monitoring protocol completed and awaiting edits
- Monitoring sites established



Results cont'd

- Specimens sent to lab through Wyoming Game and Fish
- HOBO data temp loggers deployed by USGS

Discussion

- S&RM (Science and Resource Management Staff) should be present at data collection programs
- Monitoring site locations should be subject to change
- Awaiting results from Wyoming Fish and Game Lab
- Reinstallation of HOBO logger strongly advised
- Wayside to be posted at Kelly Warm Springs soon
- Monitoring protocol will be continued as Senior capstone

Conclusion

- This “Pilot Year” has been completed and prepared the project to continue
- Project will be lead by the NPS, USGS, and they Wyoming Fish and Game for the future
- This four year project will lead to an end result of the restoration of the Kelly Warm Springs and the connected water-ways to a Natural State
  - The National Park Service preserves unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations

Acknowledgements

- Supervisors
  - Kathy Mellander
  - Megan Kohli
- Wyoming Game and Fish
- United States Geological Society

Questions?

- Any further questions or comments please contact myself at:
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Abstract

- Kelly Warm Springs, one of a few thermal features located in Grand Tetons National Park, has long been home to aquarium fish and other non-native aquatic species that have been dumped there by visitors to the park. The non-native species have thrived in the springs and in the attached waterway. These non-native species have been found less than a half mile from the Snake River, posing a threat to its health. Following the mission of the National Park Service to protect and preserve the resources for the enjoyment of future generations, the park service formed a four year project to monitor, and inventory plant, animal species and water quality, and educate the public in hopes of repairing this thermal feature to a natural state. Preparing for this project has consisted of establishing monitoring protocols, collecting data, and posting signs, as well as forming and conducting both interpretation and Citizen Science programs. This project has been initiated and ready to move forward with identifying the extent of the human induced damage to the Kelly Warm Springs and the connecting waterway, allowing for the hopeful recovery of the thermal feature in Grand Tetons National Park.